EPA's Supplemental Comments on Draft Proposed Site-Specific Criteria and Seasonal Use Revision for Chuit River and Three Tributaries

March 25, 2015

The Alaska Department of Environmental Conservation (ADEC) provided draft water quality standards (WQS) revisions and supporting draft decision documents to the U.S. Environmental Protection Agency (EPA) for review on July 30, 2014. The proposed WQS revisions include site-specific criteria (SSC) for four metals and seasonal revision of the agricultural use for specified waters in the Chuitna basin. EPA provided comments for ADEC's consideration on December 12, 2014 and January 8, 2015. ADEC subsequently requested that EPA provide any additional comments that we may be considering regarding the WQS revisions. The following comments and clarifications are provided by EPA in response to this request.

General Comments

Representativeness of Sampling for Development of the SSC – EPA provided comments on 12/12/2014 regarding the representativeness of the sampling location used for the toxicity tests that underlie the water effects ratios (WERs) used to develop the aquatic life SSC for aluminum, copper, and zinc. The toxicity of all three of these metals is affected by pH, dissolved organic carbon (DOC), and various ions present in the waters. With respect to copper, EPA stated that "...ADEC has not supplied adequate evidence that Station 141 reflects the full temporal and spatial variability of the water chemistry in the watershed." Relative to aluminum, EPA stated: "Given the large variability in results observed within samples from one location, it is likely that additional tests across additional locations would reveal larger spatial and temporal variability." Although not explicitly stated in the 12/12/2014 comments, chemistry variability within the site is also relevant to zinc because the toxicity of zinc is similarly affected by pH, DOC, and the ion content of the water.

Because of the variability in factors that affect metals bioavailability and to ensure that the SSC are protective of the entire site to which they apply, all types of surface waters should be considered during selection of sample locations. Waters of the streams to which the SSC will be applied pass through wetlands, and they also appear to pass through lakes in several locations, according to available maps. The chemical characteristics of wetland and lake waters may be different from stream water, and the bioavailability of metals in wetlands and lakes may therefore also be different from streams. In this case, the SSC and underlying WERs may not be representative of those lakes and wetlands.

Based on information provided in *Chuitna Coal Project Mine Sites Lakes Preliminary Water Quality Assessment Summary Report* (PacRim Coal, 2010), the four lakes tested in 2009 had "lower ion concentrations than typically found in the surface waters and ground waters in the

area" and correspondingly lower hardness values. This implies that any added metals could be more bioavailable in these lakes than in the streams or in groundwater used to supplement stream flows as part of the mine dewatering process. If any lakes in the mine project area receive water from streams to which the SSC would apply, the lake water chemistry would need to be considered to evaluate the representativeness of the sampling locations used for SSC development.

Water quality data for wetlands were not available for EPA review and parameters that affect metals toxicity relative to stream water could not be evaluated. Wetland waters may exhibit lower pH than stream waters, which could result in greater bioavailability of metals. Waters in wetlands should be evaluated to ensure that the WER would apply and the SSC would be protective.

Clarification of EPA Comment Regarding the Aluminum WER – In its December, 2014 comments, EPA expressed a concern that there was a high degree of uncertainty regarding what would be an appropriately protective WER for aluminum for the site, and recommended that either additional testing be performed or that the WER of 2.68 be used (i.e., the lowest of the three aluminum WERs that have been determined to date). However, given the high degree of uncertainty as to whether the site has been adequately characterized by the three site water samples used in the WER determinations, EPA is clarifying now that the use of a WER of 2.68 would require further justification to demonstrate that it is protective of the site.

Tribal Resource Rights – When acting on a state's WQS submission, the EPA must ensure that the WQS comply with the CWA as well as any other applicable laws. This may include laws that apply to tribal resources, such as reserved fishing rights found in treaties, court cases, and federal statutes (e.g., land claim settlement acts). Accordingly, the State's proposed rule should address any applicable tribal resource rights, including reserved fishing rights, and evaluate whether the WQS revision may impact those rights and if so, how those rights may be impacted. EPA is available to assist the State to in identifying other applicable laws and evaluating how they may impact ADEC's WQS revisions.

Specific Comments

ADEC's draft site-specific criteria decision document includes a number of areas where clarification would be useful. Some of these involve what appear to be inconsistencies within the document. The following comments provide examples of material that would benefit from clarification:

1. EPA has been presuming that "Tidewater terminus" means the furthest downstream point on Chuit River where there is no tidal effect, i.e., no tidal influence on river flow and no salt water component influencing water chemistry or biology. However, it would be useful for ADEC to define what it means by "Tidewater terminus" (page 1/title page and elsewhere).

2. On page 4 there is a statement that "The proposed SSC for aluminum, copper, zinc, and manganese will fully protect the designated uses in 18 AAC 70.020(b) …" It seems the reference should be to 70.020(a) rather than 70.020(b). 70.020(a) of ADEC's water quality standards lists designated uses, while 70.020(b) lists criteria to protect those uses.

3. On page 5 there is a statement that "Only fathead minnows were tested for aluminum toxicity." However, the WER report indicates that tests with *D. magna* were also performed in the first two WER rounds for aluminum.

4. On page 7 there is a statement that "PacRim refers to Bass Creek, Middle Creek, and Lone Creek as 2002, 2003, and 2004 Creeks respectively in their reports and in Figure 2." However, the pairing in that statement of Bass and Lone Creeks with their numeric names is the reverse of Figure 2 as found in the draft decision document. Figure 2 of the draft decision document indicates that Bass Creek, Middle Creek, and Lone Creek are 2004, 2003, and 2002 Creeks, respectively. The naming of these tributaries on page 10 of the draft decision document is also the reverse of Figure 2.

5. In addition to the recalculation and WER procedures that ADEC references on page 12 as being the EPA methods for developing site-specific aquatic life criteria, EPA's 1994 WER guidance and WQS Handbook also include the Resident Species Procedure. The Biotic Ligand Model (BLM) can also be used to develop site-specific aquatic life criteria for copper.

6. A statement on pages 12-13 indicates that the final WER values calculated for copper and zinc were based on *Daphnia magna* and *Pimephales promelas* toxicity data. The 2010 WER report indicates that toxicity tests with fathead minnows (*Pimephales promelas*) were performed in the first round of WER testing for copper and zinc; however, Table 4 of the draft decision document indicates that the final WERs were calculated using only the *D. magna* data.

7. The copper WER values presented in Table 4 (page 14) of ADEC's draft decision document of 8.49, 5.42, and 5.11 for the individual WER rounds are consistent with those in Tables 3.10, 3.11, and 3.12 and section 4.2 of the 2010 WER report (pages 22, 23, and 30). However, division of the site water LC50 by the site hardness normalized lab water LC50 (or SMAV as applicable) in the last column of those tables yields 8.8, 5.2857, and 4.875, for rounds 1 thru 3, respectively (before rounding). This comment provides additional detail to the second footnote for the table titled *Comparison of BLM and WER-based Criteria for WER Round 3* on page 3 of EPA's December, 2014 comments.

8. The text of the decision document on page 23 indicates that the calculated site-specific human health criterion value for consumption of aquatic organisms only is 0.283 mg/L. EPA's calculation using the same equations and input values that ADEC presents on page 22 indicate that the value for consumption of aquatic organisms only is 2.83 mg/L, ten times greater.

Related to this discrepancy, EPA is correcting a comment concerning the human health site-specific criteria for manganese, with regard to significant figures and rounding (page 8 of EPA's 12/12/14 comments).

Rather than:

EPA recommends that ADEC provide a justification for adjusting the criterion for consumption of aquatic organisms only from 0.283 to 0.300 mg/L based on appropriate rounding and significant figure procedures.

EPA's comment is:

EPA recommends that ADEC provide a justification for adjusting the criterion for consumption of <u>water + aquatic organisms</u> from <u>0.293</u> to 0.300 mg/L based on appropriate rounding and significant figure procedures.

9. The discussion of site-specific BCFs for manganese on page 25, including Figure 7, indicates that data from sites 110 and 180 were used, and associates those sites with Chuit River and Lone Creek. Table 6 (page 20), however, presents manganese data and indicates that site 110 is on Bass Creek and site 180 is on Middle Creek. The latter designations are consistent with sampling site descriptions found in PacRim's surface water baseline report (Riverside, 2009).

10. The last sentence on page 34 refers to data for "dissolved organic matter" in Table A1; however, Table A1 is labeled "Total Organic Carbon."

11. Table B2, page 49, presents water quality data for the sample used in the metals mixture toxicity test, and additional data for that sample are presented in the SSC methodology review (Sofield, 2014); however, the stream flow when the sample was collected for the metals mixture toxicity test has not been reported.

12. The values presented in Tables B3 and B4, page 51, for the "dissolved acute criterion" for copper and zinc, presumably intended to represent the proposed acute site-specific criteria for those metals, do not match the values presented in Table 5, page 16, for the proposed acute site-specific criteria for copper and zinc.

<u>Further Considerations</u>

Additional considerations regarding the proposed SSC and agricultural use change may arise during the course of EPA consultation with the National Marine Fisheries Service and the U.S. Fish and Wildlife Service under the Endangered Species Act and during government-to-government consultation with the Tyonek native village and others, as applicable. ADEC's response to these and earlier comments may also generate additional comments. EPA supports ADEC's effort to identify all considerations related to the proposed Chuitna SSC and agricultural use change and will keep ADEC apprised of any new issues raised during tribal consultation and ESA consultation with the Services, as applicable.